



# FAQ

requently asked questions

collacone<sup>®</sup> & collafleece<sup>®</sup>

botiss  
biomaterials

What kind of products are  
collacone<sup>®</sup> and collafleece<sup>®</sup>  
and what are they used for?

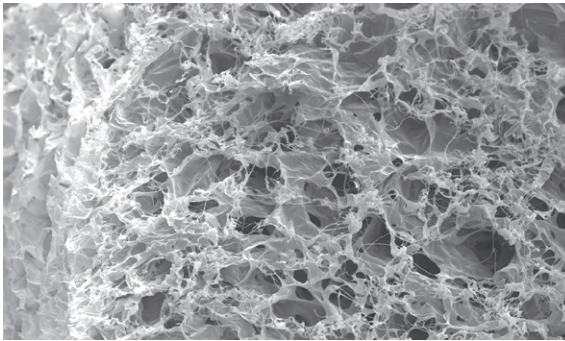
**collacone® and collafleece® are collagen sponges that are used to promote wound healing and serve as hemostatic agents.** The hemostatic effect of both products is based on the inherent hemostatic properties of natural collagen and its role in the physiological coagulation cascade (see page 8). The hemostatic properties of the natural collagen are preserved during the purification and manufacturing process.



What are collacone® and collafleece® made of?

How are they manufactured?

**collacone® and collafleece® are produced from porcine dermis in a standardized, controlled purification process.** The dermis is carefully cleaned in several wet-chemical washing steps and afterwards chopped. The resulting collagen suspension is lyophilized and sterilized by gamma irradiation. The unique production process guarantees a safe end-product free from cells and chemical residues.

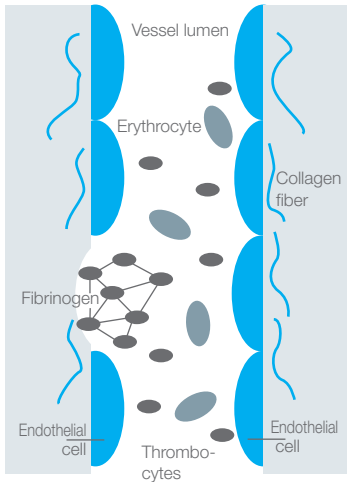


The final product shows a very porous, sponge-like structure that takes up blood easily and provides a matrix for the interaction with thrombocytes, fibroblasts and osteoblasts.

SEM picture of collafleece®, 100-x magnification

How do collacone® and collafleece® help  
to control bleeding?

How is the blood clot or  
wound area stabilized?



The hemostatic effect of collagen is well known and results from the interaction of thrombocytes with collagen, which is an important starting point for the coagulation cascade.

In the human body, damage to the blood vessel wall leads to exposure of subendothelial collagen. The collagen binds to specific receptors on the surface of thrombocytes causing their aggregation and activation followed by the release of different coagulation factors that assist in the formation of the blood clot<sup>1, 2</sup>.

**Accordingly, collagen sponges like collacone® and collafleece® support the formation of a blood coagulum and contribute to a rapid stabilization of the wound area<sup>3</sup>.**

What are the advantages  
of porcine collagen?



Collagen is a highly versatile material that, due to its low immunogenicity and biocompatibility is widely employed in biomedical and pharmacological applications. In addition, collagen undergoes a controlled enzymatic degradation resulting in endogenic, natural degradation products without any toxic effect.

**Particularly porcine collagen is biocompatible.** The pig genome is 84.1% homologous to the human genome<sup>4</sup>, one of the closest taxa after the primates, and the amino acid sequence of porcine and human collagen strongly resemble each other. Based on this high homology porcine collagen shows a very low antigenicity<sup>5</sup>.

What are the indications for  
collacone<sup>®</sup> and collafleece<sup>®</sup>?

Collagen sponges and cones are indicated for local hemostasis wherever capillary, venous, small arterial and diffuse seeping bleedings must be stopped. They stabilize the blood clot, help to control the bleeding and support the wound healing.

Among the main indications, further applications of both products are closing and treating biopsy harvesting sites, as well as smaller oral wounds or transplant harvesting sites (bone blocks, CTG, FGG).

According to its cone-shape, collacone® is primarily used as a hemostatic agent following tooth extractions.

**Furthermore, collafleece® can be applied during sinus floor elevation in order to prevent perforation of the Schneiderian membrane or to repair smaller perforations (< 0.5 mm).** In this indication, the fleece offers a cost effective alternative to the use of a barrier membrane.

What are the advantages  
of applying collacone<sup>®</sup>  
after tooth extraction?

**The spongy collagen structure of collacone® encourages the formation of a coagulum and provides an ideal structure for the adhesion of thrombocytes, fibroblasts and osteoblasts.** Fine blood vessels grow into and through the cone, connecting it to the surrounding tissue. Consequently, a preliminary tissue is formed in the alveole that is supplied with oxygen, nutrients and important signalling molecules supporting the bony regeneration. Furthermore, the form-fitted cone shape protects the wound area from the entry of food and bacteria.

collacone® application is particularly beneficial in hemostatic compromised patients to prevent post-operative bleeding events. Medication with anticoagulant drugs (i.e. heparin or warfarin) poses a higher risk of bleeding following tooth extraction. Local hemostatic agents like collagen sponges can prevent post-operative bleeding without the need to pause the anticoagulant therapy<sup>6</sup>. A retrospective study with 200 anticoagulated patients showed a very low rate of bleedings following application of collacone® in fresh extraction sockets<sup>7</sup>.

Are there contraindications  
for the use of  
collacone<sup>®</sup> and collafleece<sup>®</sup>?

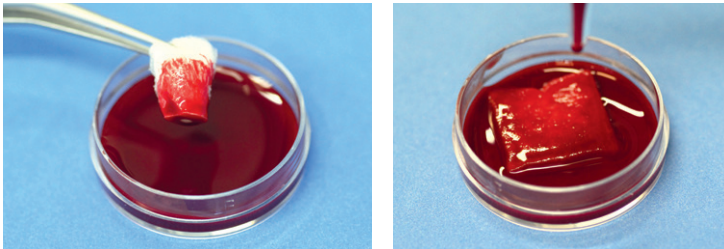
**As with most hemostatic agents, collagens are not intended for use in infected or contaminated wounds where they may form abscesses due to bacterial colonization.** In an animal model, incision sites inoculated with *Staphylococcus aureus* demonstrated increased infection when collagen was used as compared to controls. Such results are similar to what has been reported for other hemostatic agents<sup>8</sup>.

Should I hydrate collacone<sup>®</sup>  
and collafleece<sup>®</sup> prior to use?



**Generally, dry application of the collagen sponges is recommended, because soaking or moistening prior to application may impair their hemostatic properties.** At the defect site, the material rapidly soaks up blood due to its spongy and porous structure. collacone® and collafleece® maintain their integrity in the presence of blood and during application.

collacone® and collafleece® can also be loaded with liquid antibiotics for application in infected sites.



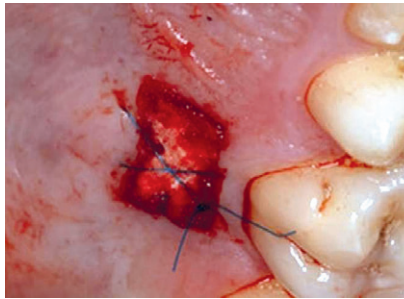
Do I have to fix  
collacone<sup>®</sup> and collafleece<sup>®</sup>?

**A direct fixation of collacone® or collafleece® by sutures/pins is not possible, but also not necessary.**

When applied in extraction sockets, collacone® sticks to the wound and forms a gel like bond with the blood. Fixation by cross- or holding sutures could help keeping the cone in place. The same applies to collafleece®, e.g. when applied at soft tissue harvesting sites.



With courtesy of Dr. F. Rojas-Vizcaya, Spain



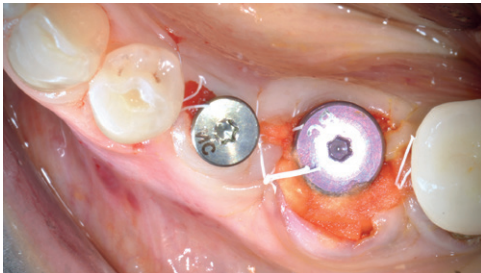
From Ozcelik et al. 2016, J Clin Periorontol<sup>9</sup>

When can I place implants  
following socket grafting  
with collacone<sup>®</sup>?

According to the concept of early implantation, the implant is placed after tooth extraction, before the bony regeneration takes place within the socket. **Typically, it is performed about 4-8 weeks after tooth extraction; at this point, the healing of the soft tissue is completed and potential inflammations have disappeared.**

Can I use collafleece<sup>®</sup>  
in GBR procedures  
instead of a barrier membrane?

**collafleece® resorbs quite quickly within 2-4 weeks and therefore does not offer a sufficient long barrier function to ensure undisturbed regeneration of bone defects and augmentation sites.**



Gaps around implants filled with particulate grafting material and covered with collagen fleece – Dr. M. Frosecchi, Italy

However, collafleece® can be applied as a cost-effective alternative to a barrier membrane in situations where the intention is not to support Guided Bone Regeneration, but a temporary protection of the wound and support of hemostasis. One example is covering grafted extraction sockets (preferably with following primary closure of the mucosal flap) or covering grafted gaps around immediately placed implants. In addition, collafleece® is a cost-effective alternative to barrier membranes during sinus floor elevations for the protection of the Schneiderian membrane or to cover minor perforations.

Are collacone<sup>®</sup> and collafleece<sup>®</sup>  
intended for open healing?



In case of a dehiscence or open healing the wound usually heals without complications by the formation of granulation tissue and free contraction.

The main problem of an exposure of a collagen membrane is its fast bacterial resorption resulting in loss of the barrier function.

**As the intention of collafleece® and collacone® is not providing a barrier but supporting wound healing and hemostasis, fast resorption in case of open healing is not a problem.**

## Literature:

1. Nuyttens BP, Thijs T, Deckmyn H, Broos K. Platelet adhesion to collagen. *Thromb Res.* 2011; 127 Suppl 2:S26-9.
2. Versteeg H.H, Heemsker J.W.M, Levi M, Reitsma P.H. New fundamentals in hemostasis. *Physiological Reviews* 2013; 93(1): 327-358.
3. Masci E, Santoleri L, Belloni F, Bottero L, Stefanini P, Faillace G, Bertani G, Montinaro C, Mancini L., Longoni M. Topical hemostatic agents in surgical practice. *Transfusion and Apheresis Science* , Volume 45 , Issue 3 , 305 – 311.
4. Fang X, Mou Y, Huang Z, et al. The sequence and analysis of a Chinese pig genome. *GigaScience.* 2012;1:16. doi:10.1186/2047-217X-1-16.
5. Heinrich W, Lange PM, Stirz T, Iancu C, Heidermann E. Isolation and characterization of the large cyanogen bromide peptides from the 1- and 2-chains in pig skin collagen. *FEBS Letters* 1971;16: 30.
6. Morimoto Y, Niwa H, Minematsu K. Hemostatic management of tooth extractions in patients on oral antithrombotic therapy. *J Oral Maxillofac Surg.* 2008 Jan;66(1):51-7. PubMed PMID: 18083415.
7. Zirk M, Fienitz T, Edel R, Kreppel M, Dreiseidler T, Rothamel D. Prevention of post-operative bleeding in hemostatic compromised patients using native porcine collagen fleeces-retrospective study of a consecutive case series. *Oral Maxillofac Surg.* 2016 Sep;20(3):249-54. doi: 10.1007/s10006-016-0560-7. Epub 2016 May 2.
8. McBee WL, Koerner KR. Review of hemostatic agents used in dentistry. *Dent Today.* 2005 Mar;24(3):62-5; quiz 65, 61.
9. Ozcelik O, Seydaoglu G, Haytac CM. Diode laser for harvesting de-epithelialized palatal graft in the treatment of gingival recession defects: a randomized clinical trial. *J Clin Periodontol.* 2016 Jan;43(1):63-71.